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High Prevalence of BLV in U.S. Dairy Herds

Results of the National Animal Health Monitoring System's (NAHMS) Dairy '96 study showed widespread distribution of bovine leukosis virus (BLV) in U.S. dairy herds. Study results suggest that control of this infection in dairy operations will require both culling and management strategies to reduce risk of animal-to-animal transmission.

Bovine leukosis virus (BLV) is a retrovirus infection of dairy and beef cattle that causes malignant lymphoma in 1 to 5 percent of infected cattle. Clinical signs of malignant lymphoma become evident as the tumors invade different tissues and may include weight loss, decreased milk production, enlarged lymph nodes, loss of appetite, rear-limb weakness or paralysis, fever, protruding eyeballs, gastrointestinal obstruction, abnormal heartbeat, and increased blood lymphocyte count. Malignant lymphoma is invariably fatal in cattle and significant mortality may occur in some infected herds, especially when the prevalence of infection is high. There are no drugs to treat the cancer. BLV is not transmissible to humans, and no human disease has ever been attributed to BLV.

A 1980 national study of BLV in Canada¹ showed that 40 percent of its dairy herds and 11 percent of its beef herds were infected. Within-herd seroprevalence in dairy cattle was 18 times higher than it was in beef cattle. BLV control programs have been established in member countries of the European Economic Com-

munity (EEC) since the 1980s. According to a 1987 report, seroprevalence in the entire EEC cattle population rarely exceeds 0.5 percent to 1.5 percent.² BLV infection has been reported by many other countries, but valid national estimates of seroprevalence are rare.

In the U.S., previous studies of BLV have been restricted to a few states, small regions within those states, or single herds. Seroprevalence varied among those herds from 0 to 95 percent of the cattle sampled. Data from herds participating in the leukemia certification program in New York suggest that when the seroprevalence is high, morbidity and mortality from malignant lymphoma may be economically significant. In herds with low seroprevalence, morbidity and mortality may not be economically significant. Other economic losses associated with BLV infection are due to restrictions on trade of infected animals and germplasm. *Standards for Certification of Cattle Herds as Bovine Leukosis Virus Free* was published by the Bovine Retrovirus Committee of the U.S. Animal Health Association.³

An assessment of BLV prevalence in U.S. dairy operations was part of the NAHMS Dairy '96 study. Between February and May of 1996, randomly-selected dairy operations with at least 30 milk cows in 20 states⁴ representing 79 percent of the U.S. dairy cow population were visited by federal or state animal health officials. Blood samples were collected from milk cows on 1,006 participating operations and sent to the USDA's National Veterinary Services Laboratories for BLV testing using the AGID test.

Dairy '96 results showed that 89 percent of U.S. dairy operations had cattle seropositive for BLV.

1 Samagh, B.S. and Kellar, J.A. Seroepidemiological survey of bovine leukaemia virus infection in Canadian cattle. 1980. In: Straub, O.C. (eds.): *Current Topics in Veterinary Medicine and Animal Science*, Vol. 15, pp. 397-411.

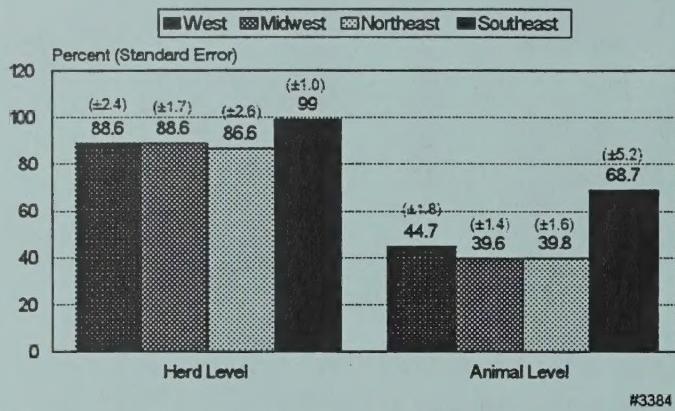
2 Lorenz, R.J. and Straub, O.C. 1987. The epidemiology of enzootic bovine leukosis. In: Burny, A. and Mammerickx, M. (eds.): *Developments in Veterinary Virology: Enzootic bovine leukosis and bovine leukemia virus*. Boston, Martinus Nijhoff, p. 52-68.

3 Proceedings: 99th Annual Meeting of the U.S. Animal Health Association. Reno, Nevada, October 28-November 4, 1995.

4 Participating states: California, Florida, Idaho, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New Mexico, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Vermont, Washington, and Wisconsin.

Figure 1

Bovine Leukosis Virus Herd and Animal Level Infection Status
in U.S. Dairy Herds by Region



Herd prevalences in the west, midwest, and northeast regions were 87 to 89 percent, while the southeast region had a herd prevalence of 99 percent (Figures 1 and 2). Virtually all animals tested in some herds were seropositive. In the southeast region, the individual animal prevalence was higher than in other regions.

Both herd and individual animal prevalences were slightly higher on operations with 200 or more cows than in smaller herds (Figure 3). Individual animal seroprevalence was at least 25 percent in 75 percent of the positive herds (Figure 4).

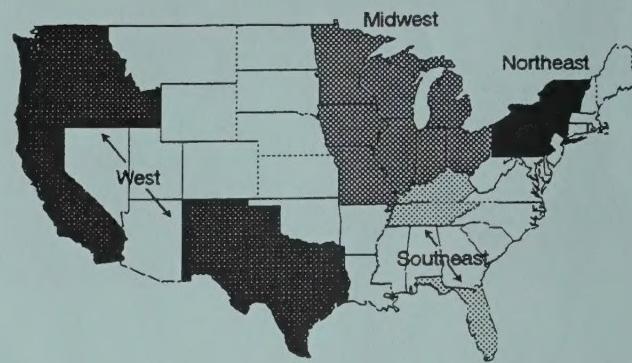
These national estimates of BLV infection show a high prevalence and broad geographic distribution of the infection in the U.S. The high individual animal prevalence in seropositive herds indicates that culling alone will not be a cost-effective method for reducing BLV seroprevalence in those herds. Control strategies in which culling and risk factor management are combined may be the only cost-effective methods for reducing incidence of infection in high-prevalence herds. An accurate analysis of the risk factors for BLV infection will enhance the success of such control efforts where warranted.

The Dairy '96 study provided estimates of BLV infection in U.S. dairy cattle and herds that can be used to: 1) assist herd control programs through education of veterinarians, animal health officials, and producers and 2) provide a baseline from which to monitor progress. It is difficult to compare results of the U.S. study with information from other countries because only the EEC, where control efforts have been underway for many years, and Canada have published results of similar prevalence surveys.

NAHMS collaborators included the USDA's National Agricultural Statistics Service (NVSL), USDA's National

Figure 2

Dairy '96 Regions for Bovine Leukosis Virus Analysis



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Figure 3

Bovine Leukosis Virus Herd and Animal Level Infection Status
in U.S. Dairy Herds by Herd Size

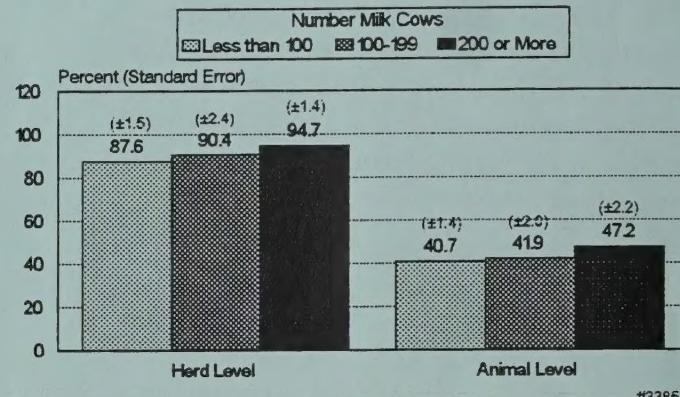
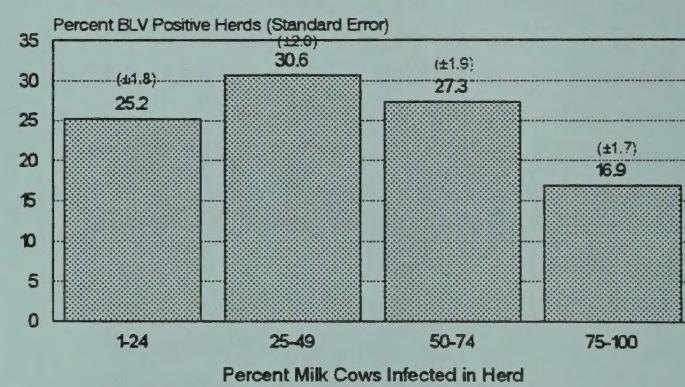
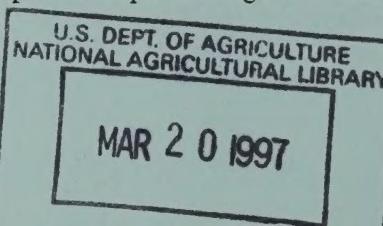


Figure 4

Range of Individual Animal Prevalences of
Bovine Leukosis Virus (BLV) in Positive U.S. Dairy Herds



Veterinary Services Laboratories (NVSL), and State and Federal Veterinary Medical Officers. For more information, contact the Centers for Epidemiology & Animal Health, USDA:APHIS:VS, Attn. NAHMS; 555 South Howes; Fort Collins, CO 80521; (970) 490-8000; Internet: nahms_info@aphis.usda.gov; Web site: <http://www.aphis.usda.gov/vs/ceah/cahm>



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